Emergency Power

How to safely connect
Emergency power sources
To your residence

Why this Section?

- Electric generators are potentially lethal if not used properly. There is a very real risk of injuring or killing someone working on power lines with an improperly connected generator. Homeowners should know the correct way to use a backup generator for their home. This section will explain how a generator transfer panel is properly installed. I will alert you to potential dangers and provide some insight on the workings of electricity. You will understand better the reasoning behind the need of a transfer panel instead of a simple double male extension cord. It is not my intent to encourage homeowners to make wiring changes, but rather to provide information which will promote safe and proper generator use.

Things to consider.

- How “much” generator do I really need?
- Where will my generator be installed?
- How will I interface my generator to the equipment I want to run?
- How much money do I have to invest in this project?
- Will I be doing this project myself or will I have it done by a contractor?

How ‘much’ generator do I really need?

- Radio equipment
- Furnace
- Refrigerator
- Convenience receptacles
- Freezer
- Microwave
- Espresso machine (This IS Seattle!)
- Sump & Septic pumps

Where will my generator be installed?

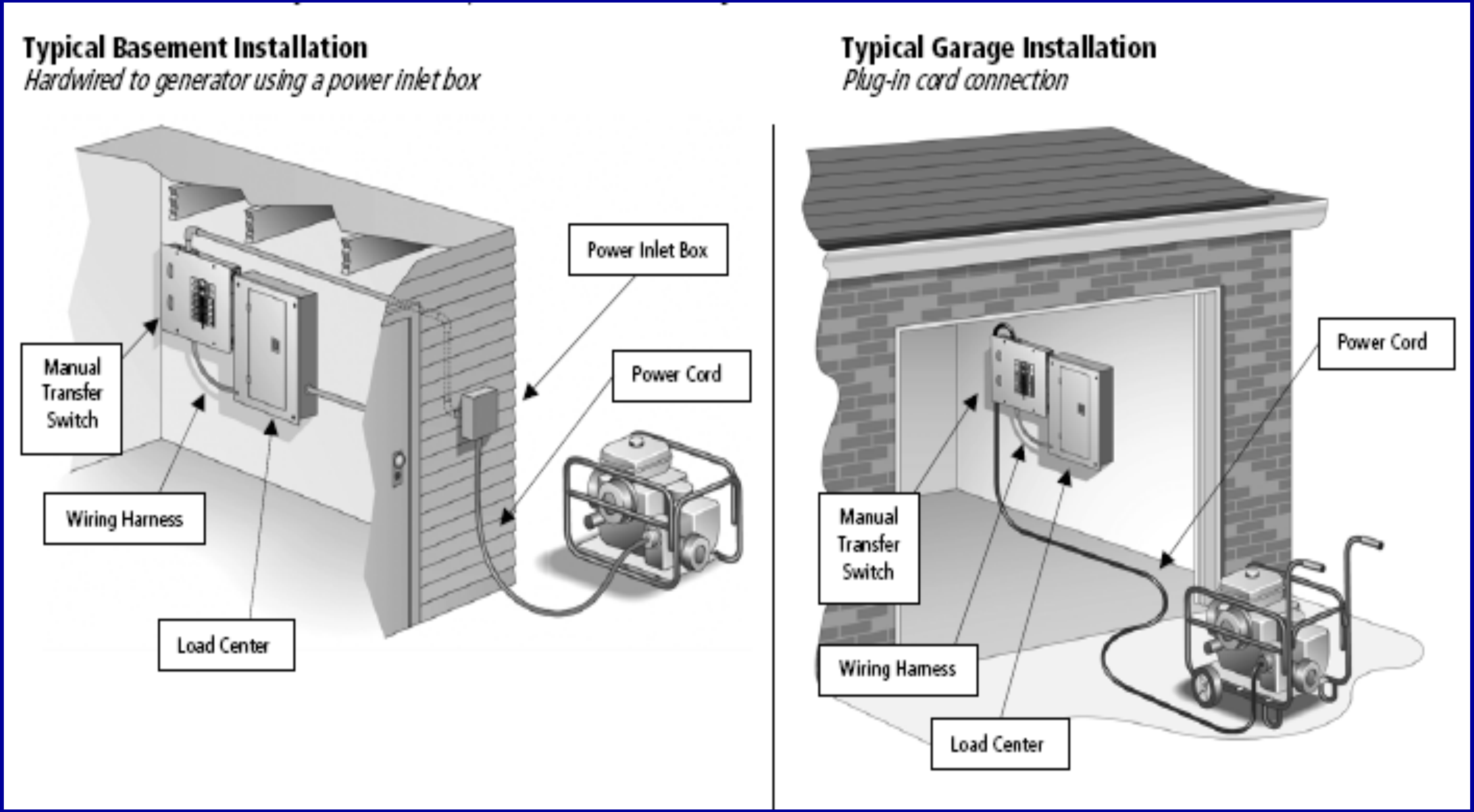
- Portable
- Relatively easy to move around
- Can use for other purposes than at home
- Can be stored off-site if need be
- Generally limited in capacity
- Must have adequate fuel stored as well
- Typically connected by a cord
- Typically are 10Kw or smaller

Where will my generator be installed?

- Fixed
- Normally NOT readily transportable
- Higher capacity
- Can use fixed fuel sources
- Natural Gas
- Propane
- Diesel
- Generally permanently connected

Typical installations

Courtesy of Gen-Tran Manufacturing



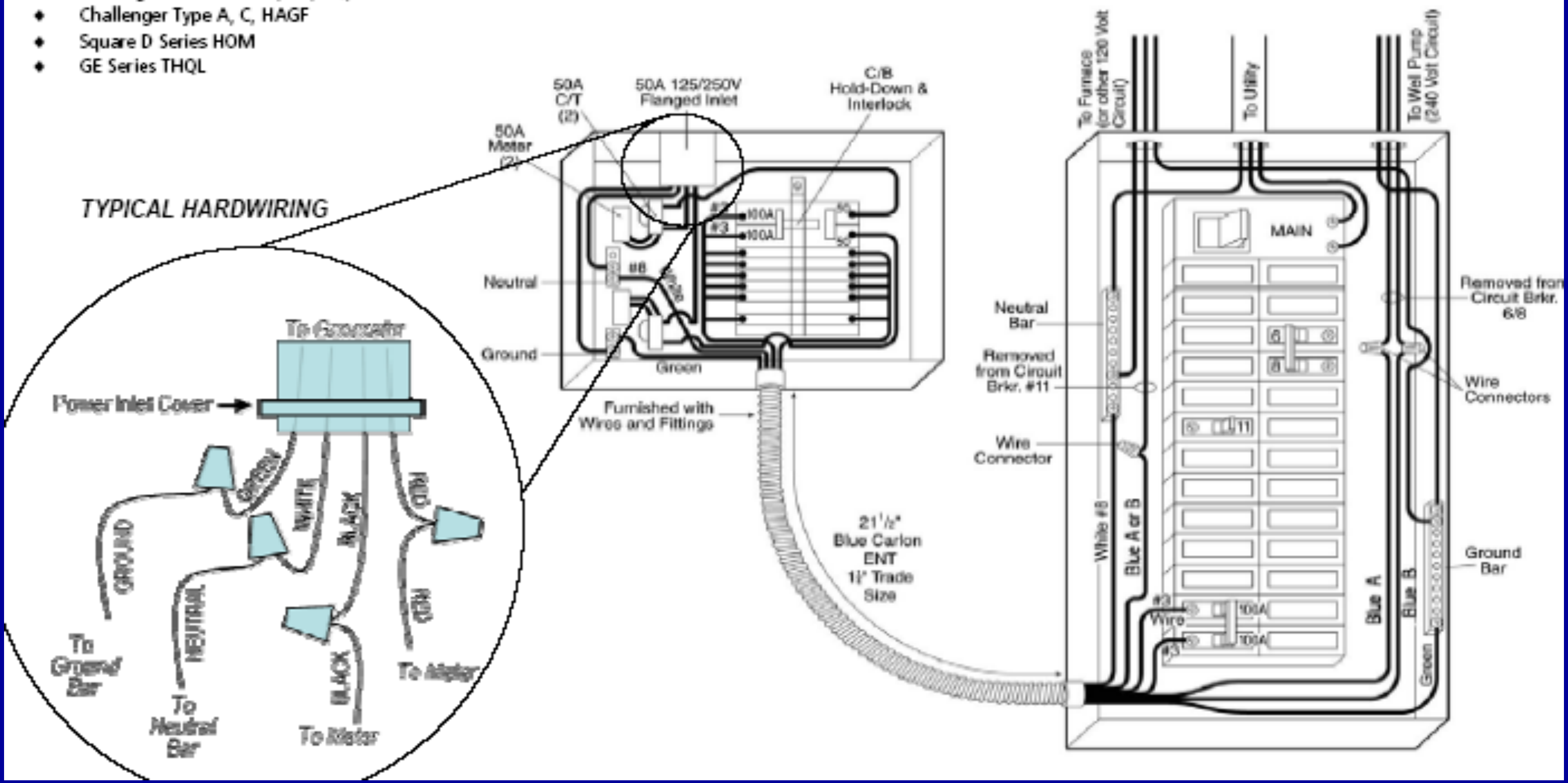
Basic installation guide

TABLE 3 – Compatible Circuit Breaker Types:

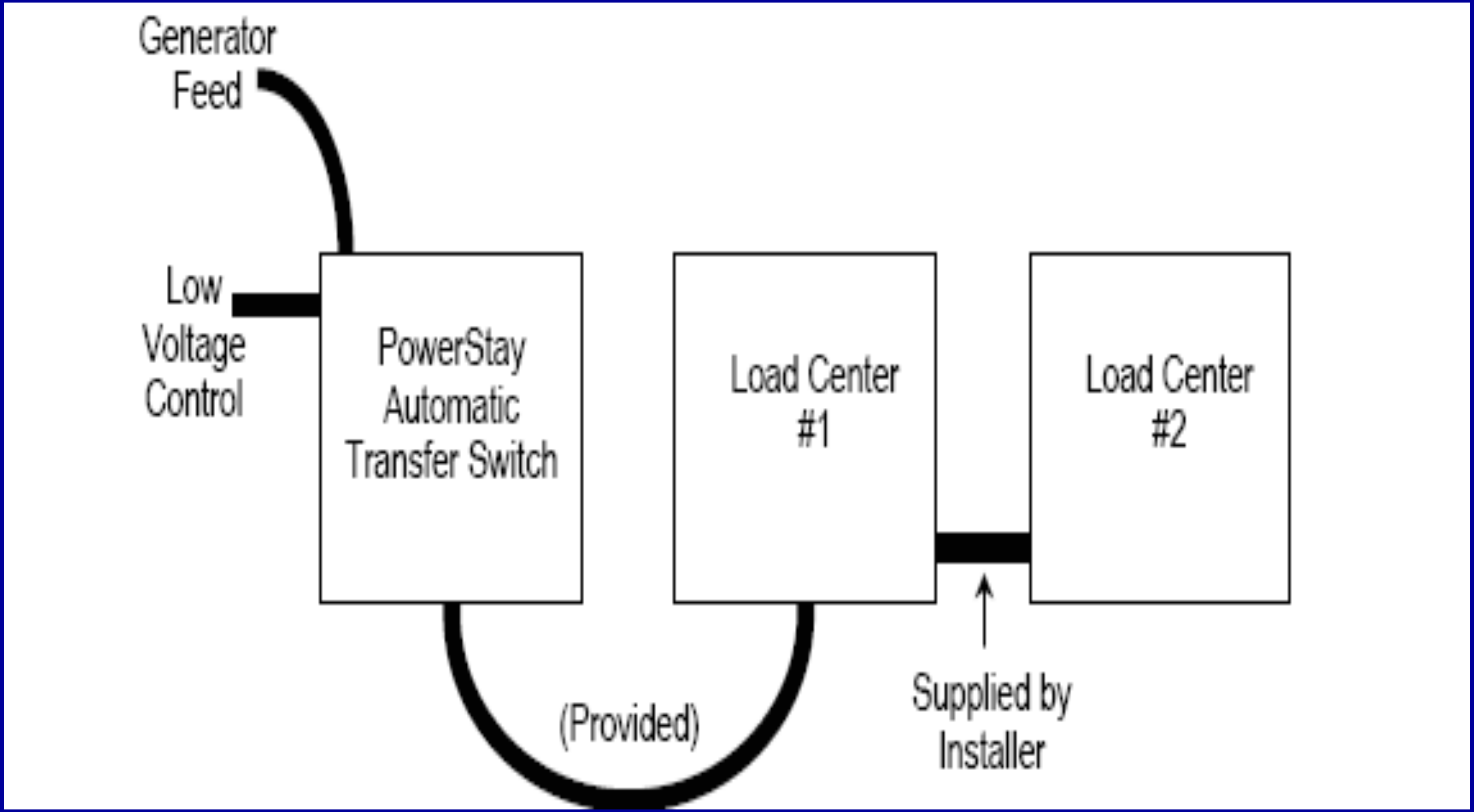
- Siemens QP, QT, QPH, HQP, QPF, QPHF, QFP, QE, QEH
- Westinghouse Series BD, BR, BQ, GFC
- Challenger Type A, C, HAGF
- Square D Series HOM
- GE Series THQL

Compatible GFCI, Arc-Fault/ Surge Protection Circuit Breakers:

- Siemens: QPF (GFCI), QAF (Arc Fault), QP (Surge Protector)



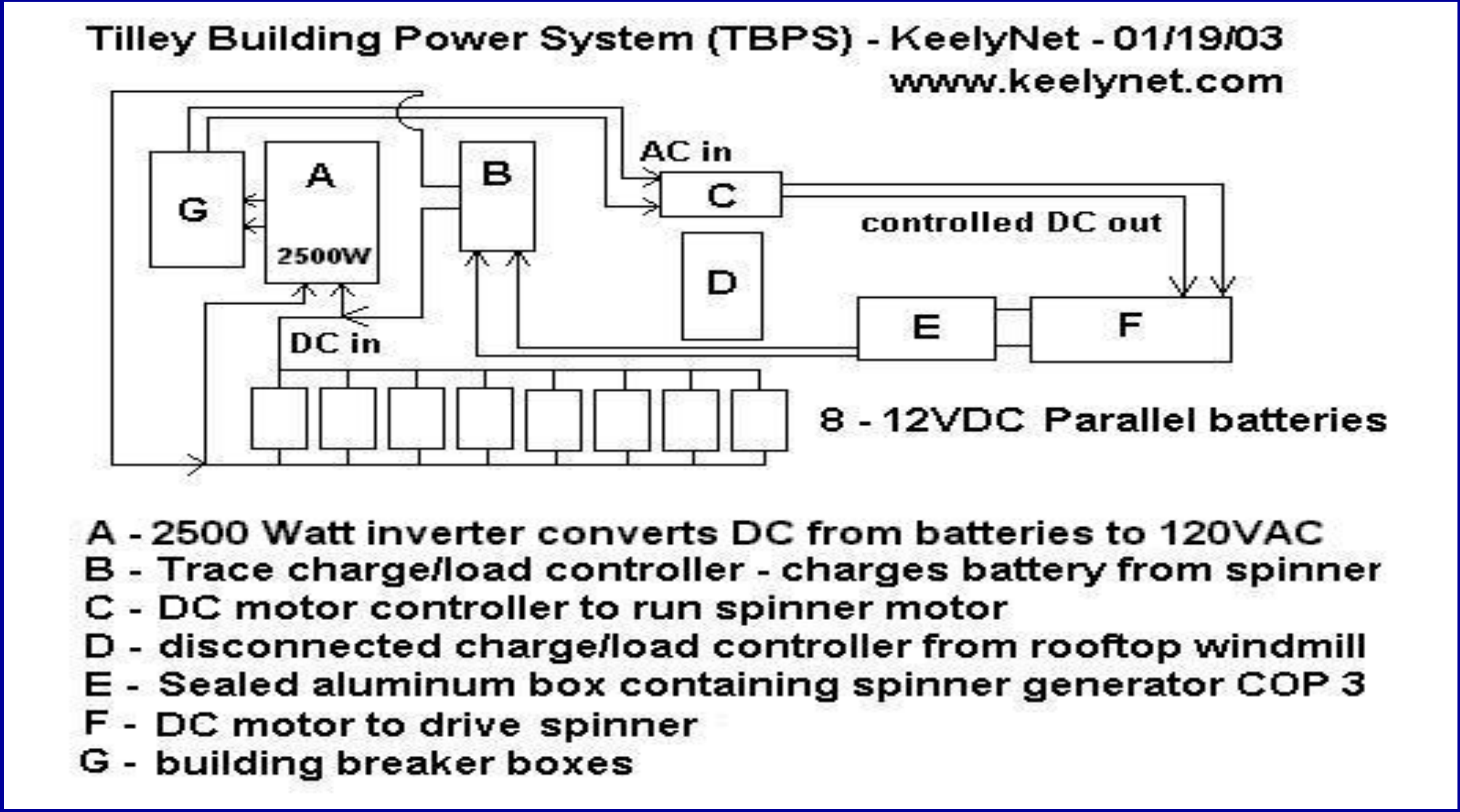
Auto-Transfer Block Diagram



How much will this cost?

- Generators: $700 - $2000   (5Kw)
- And they go up from there!
- Solar/Mechanical $3000/Kw

Solar Power Interface



Tilley Building Power System (TBPS) - KeelyNet - 01/19/03
www.keelynet.com

A - 2500 Watt inverter converts DC from batteries to 120VAC
B - Trace charge/load controller - charges battery from spinner
C - DC motor controller to run spinner motor
D - disconnected charge/load controller from rooftop windmill
E - Sealed aluminum box containing spinner generator COP 3
F - DC motor to drive spinner
G - building breaker boxes

UTIL
GEN
A
B
GenTran

Solar Power Basics

- **INITIAL PLANNING QUESTIONS**
- **12 Volts, 24 Volts, or 48 Volts for your batteries?**
- Battery voltage is difficult to change after your system is built, so choose carefully at the start.
- **12 volts is simplest and most standard, used in vehicles, RV, and boats. If you want a small simple power system, 12 volts will probably be easiest. You can use 12 volt DC directly in very small systems, adding 120 volt AC with an inverter.**
- **24 volts battery systems have some technical advantage. SYSTEM SIZE: If you think you will have more than 1000 watts of solar modules, consider 24 volts. A technical advantage is that 24 volt wires can run longer distances. If you must place solar modules over 100 feet from the house for adequate sun exposure, or if your wind generator or hydropower is over 300 feet away, choose 24 volts. Most of your power will be changed to 120 volt AC power. Voltage converters are available to run 12 volt DC equipment from 24 volt batteries.**
- **48 volts has great advantage if longer wire run is unavoidable to reach the only good solar location, up to 400 feet from the house, or hydro turbine 1,000 feet from the house. Presently there is limited selection of 48 volt charge controls and inverters, but these are the best quality, well suited for larger power systems. Voltage converters are available to run 12 volt DC equipment from 48 volt batteries.**